REMARKS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This amendment is in response to the Office Action mailed May 31, 2005. Claims 1-24 were rejected.

Claims 1-24 were originally presented. Claims 1-24 remain in the application.

Claim Rejections - 35 U.S.C. § 102

Claims 1-24 (including independent claims 1, 9, and 17) were rejected under 35 U.S.C. § 102(b) as being anticipated by Hwung et al. (US 5,473,373) (hereinafter "Hwung").

In order to most succinctly explain why the claims presented herein are allowable, Applicant will direct the following remarks primarily to the originally presented independent claims 1, 9, and 17 with the understanding that once an independent claim is allowable, all claims depending therefrom are allowable.

The Hwung reference discloses an image capture and display system that contains a three stage digital gamma correction circuit for devices such as camcorders and cameras. (See Hwung, Abstract). The device can be used when light from an original image is received by an image sensor such as a CCD in the camera or camcorder and converted into an electrical signal. (Hwung, Col. 1, Lines 15-25). A digital signal processor (DSP) is then used to enhance the image represented by the electrical signal. The enhanced signal output of the DSP is then gamma corrected using a gamma correction circuit to compensate for the well known non-linearity of a CRT display monitor.

Hwung discloses a gamma correction circuit that divides the electrical signals into three different groups, comprising low, medium, and high intensity signal levels. (Hwung, Col. 2, Lines 43-50). Gamma corrections are mathematical algorithms used to "correct", or in other words increase or decrease the level of the signal (See Equations 4, 5, and 6). Hwung discloses a linear gamma correction that is is applied to the low and high level signals. The medium level signals have an adjustable, non-linear correction applied. (Hwung, Col. 2, Lines 43-50). Thus, Hwung discloses a gamma correction circuit that can apply three different types of gamma correction to an image in an image sensor (CCD) based upon the level of the signal.

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Further, Hwung discloses a 10-bit input signal *for each pixel* sent from a DSP to a ROM look-up table for high and low level signals and to a shifter/adder for medium level signals. (See Hwung, Col. 5, Line 55 to Col. 6, Line 13). The most significant bit (MSB) determines whether the signal is sent to the ROM (MSB = 0) for low and medium signals, or to the shifter/adder for high level signals. Thus, a 9 bit signal is sent to the ROM, allowing 2^9 (512) different levels of signal amplitude, while a 10 bit signal is sent to the shifter adder, theoretically allowing 2^{10} (1024) different levels of signal amplitude, though the MSB is likely not used since it is already used to denote that the signal is a high level signal. The ROM or shifter/adder then output an 8 bit signal to the CRT. The MSB is used by a MUX to determine whether the signal was sent by the ROM or shifter/adder. Thus, Hwung does not disclose the concept of reducing the amount of memory used for gamma correction. Rather, different levels of gamma correction are used for signals of different amplitudes. But gamma correction is still performed on each pixel from the image sensor (CCD).

In contrast, the present invention (U.S. 2003/0128299 A1) (hereinafter "Coleman") teaches a method of reducing the amount of memory used for gamma correction in a video display. (See ¶ 26 of specification). Gamma correction typically requires higher levels of precision at low light levels. For example, in a system with 12-bit color precision, there are 2^{12} (4096) different levels of brightness. Changes in brightness from 0 to 255 can be quite noticeable to the human eye. Therefore, each of the first 256 levels of brightness may require a specific gamma correction coefficient. However, changes in brightness from 256 to 4095 may be less discernable to the human eye. Therefore, gamma correction may be affected with lower precision. The same gamma correction coefficient may be able to be used over a range, such as 15 different levels. For example, the same gamma correction coefficient can be used from level 256 to 271, while another coefficient can be used on levels 272 to 287, etc. (See Col. 6 in FIG. 3). Thus, in the example, a first level of precision is used for gamma correction from levels 0 to 255 and a second level of precision is used for gamma correction from levels 256 to 4095.

Coleman claims the ideas expressed in the specification. Specifically, independent claim 1 states, in part:

> providing a first level of gamma correction to the first range of pixel values at a first

level of precision; and

      providing a second level of gamma correction to the second range of pixel values at a second level of precision, different than the first level of precision.

As claimed in claim 1, Coleman is distinct from the information disclosed in Hwung. **Hwung does not teach different levels of precision between different ranges of pixel values. Rather, Hwung teaches applying different gamma correction curves having the same level of precision to pixel values having different signal levels.** (See Hwung, Col. 4, Lines 17-45; Col. 6, Lines 6-31). Hwung fails to teach a method for reducing the amount of memory used for gamma correction in a video display by providing a first and second level of gamma correction with the first and second levels having different precisions.

Therefore, Applicant respectfully submits that independent claim 1 is allowable, and urges the Examiner to withdraw the rejection.

Similarly, independent claim 9 in Coleman states, in part:

      a first gamma lookup table...to provide a first level of gamma correction to a first range of pixel values at a first level of precision; and

      a second gamma lookup table...to provide a second level of gamma correction to a second range of pixel values at a second level of precision, different than the first level of precision.

Independent claim 17 states, in part:

      a gamma lookup table...to provide a first level of gamma correction to a first range of pixel values at a first level of precision and a second level of gamma correction to a second range of pixel values at a second level of precision, different than the first level of precision.

Both independent claim 9 and 17 disclose **first and second levels of gamma correction** to be applied to first and second ranges of pixel values **at first and second levels of precision** respectively, wherein the first level of precision is different from the second. As discussed above, Hwung fails to teach using different levels of precision in gamma correction lookup

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tables. Rather, each of the different gamma correction curves disclosed in Hwung has the same level of precision. Therefore, Applicant respectfully submits that independent claims 9 and 17 are allowable, and urges the Examiner to withdraw the rejections.

Claims 2-8, 10-16, and 18-24 are dependent on claims 1, 9, and 17 respectively. Rejection of the dependent claims 2-8, 10-16, and 18-24 should be reconsidered and withdrawn for at least the reasons given above with respect to the independent claims. The dependent claims, being narrower in scope, are allowable for at least the reasons for which the independent claims are allowable.

Claim Rejections - 35 U.S.C. § 103

Claims 9-16 (including independent claim 9) were rejected under 35 U.S.C. § 103 as being unpatentable over Hwung.

The Office Action states that it would have been obvious to use two look up tables rather than one. However, this argument does not apply in view of the applicant's previous arguments. Hwung fails to disclose first and second gamma tables at first and second levels of precision. Hwung does not anticipate different levels of precision. Therefore, Applicant respectfully submits that claims 9-16 are allowable, and urges the Examiner to withdraw the rejection.

CONCLUSION

In light of the above, Applicant respectfully submits that pending claims 1-24 are now in condition for allowance. Therefore, Applicant requests that the rejections and objections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Amendment, the Examiner is strongly encouraged to call Steve Perry at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

No claims were added. Therefore, no additional fee is due.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

DATED this 31st day of August, 2005.

Respectfully submitted,

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